



Certificate No:
TAS00002ZC

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Cranes, gen.

with type designation(s)
Knuckle boom crane 10T

Issued to
SMST Designers & Constructors B.V.
Drachten, Friesland, Netherlands

is found to comply with
DNV GL standard DNVGL-ST-0378 – Standard for offshore and platform lifting appliances

Application :

Offshore crane with motion compensated knuckle boom

Issued at **Høvik** on **2021-05-21**

This Certificate is valid until **2026-05-20**.

for **DNV**

DNV local station: **Netherlands CMC**

Approval Engineer: **Khurram Saeed Khaliq**

.....
Aldo Matteucci
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2021-03

www.dnv.com

Page 1 of 5

Product description

Offshore knuckle boom crane, with motion compensated knuckle

Application/Limitation

Crane type: Offshore crane (with personnel lift)

General information:

Safe Working Load (SWL): 10 tonne

Safe Working Load and design dynamic factor is dependent on boom tip position and lifting modes as specified in:

- "Load Curves" doc. No. 1800733-B-00-13, rev. B, DNV techdoc. No. 6
- "Load Curves" doc. No. 2001040-20-B-00-13, rev. B, DNV techdoc No. 114

Design dynamic factor:

- internal lift: 1.15
- Offshore lift: 1.3
- Motion compensated lift: 1.6

Design temperature: -20°C

Heel/trim: 5°/2°

Personnel lift: 1 tonne

General comments

1. The various components transferring load (loose gear) such as hook, wire rope, sockets shackles etc. shall be manufactured according to recognized standards or codes and shall be delivered with relevant ILO form certificates.
2. For cranes to be covered by class (Notation CRANE or Crane Vessel) additional load charts and calculation for the dynamic coefficient shall be submitted, ref. DNVGL-ST-0378 Ed. July 2019, Sec.2 [2.1.3.3]
3. The crane control and safety systems are not covered by this type approval and shall be separately approved for each delivery
4. The slewing bearing is not covered by this approval and shall be delivered with a DNVGL Product Certificate based on a separate approval
5. The hydraulic cylinders are not covered by this approval and shall be delivered with DNVGL Product Certificate based on separate approval
6. The winch gears and brakes are not covered by this approval and shall be delivered with DNVGL Product Certificate
7. The sheaves for the crane are not covered by this approval and shall be delivered with DNVGL Product Certificate. Unwelded sheaves can be delivered with Works Product certificate
8. Pedestal, below the slewing bearing flange, including fastening to vessel's deck structure is not covered by this approval. It is part of the hull and shall be approved separately

Type Approval documentation

Document No.	Rev.	Title
1800752-C-07-02	A	Structural report - modified rollerbox
1800733-C-07-02	A	Structural report - stowed position
1800733-B-21-19	A	Baseframe + slew lock - partlist
1800733-B-21-15	A	Baseframe + slew lock - parts 2
1800733-B-21-17	A	Baseframe + slew lock - parts 4
1800733-B-21-16	A	Baseframe + slew lock - parts 3
1800733-B-21-13	A	Baseframe + slew lock - machining
1800733-B-21-11	A	Baseframe + slew lock - welding 1

1800733-B-21-10	A	Baseframe + slew lock - Assembly
1800733-B-21-14	A	Baseframe + slewlock - parts 1
1800733-B-11-30	A	Cabin support - assembly
1800733-B-31-19	A	Slewbearing + slew lock - partlist
1800733-B-31-10	A	Slew bearing + slew lock - assembly
1800752-C-07-01	A	Structural report - motion compensated knuckle boom 3T
1800752-C-07-01	B	Structural report - motion compensated knuckle boom 3T
1800610-B-38-10	A	Winch drive - component
2001040-20-B-00-20	B	Interface crane - interface
1800733-B-11-34	A	Cabin support - part 1
1800733-B-11-33	A	Cabin support - machining
1800733-B-11-32	A	Cabin support - welding
1800610-B-40-10	A	Hook block - component
1800733-B-11-31	A	Cabin support - welding 1
1800752-C-07-35	A	Drivesheet - rack and pinion
2001040-20-B-00-13	B	Load curves MassAndCOGOverview
1800610-B-30-19	C	5T winch 105 m - partlist
2001040-20-C-03	A	Functional specification
1800752-C-01-08	A	Telescope drive - datasheet
1800752-C-07-11	A	Load case matrix
1800752-B-36-10	A	Wire sheave Ø355/Ø18 - components
1800752-B-38-20	A	Telescope gearbox - component
1800752-B-B9-81	A	Load measuring pin Ø40 - basig design
1800752-B-B8-14	B	Swing cylinder - basic design
1800610-B-30-15	B	5T winch 105m - parts 2
1800752-B-B8-13	B	Tilt cylinder - basic design
1800752-B-35-10	A	SS wheel Ø180 - assembly/machining/parts
1800752-B-30-80	A	Fairlead - Assembly/welding/parts
1800752-B-35-19	A	SS wheel Ø180 - partlist
1800752-B-13-80	B	Telescope link option - assembly/welding/machining/parts
1800752-B-13-99	A	2-fall end option - partlist
1800752-B-13-90	A	2-fall end option - assembly/parts
1800752-B-13-89	B	Telescope link option - partlist
1800752-B-30-89	A	Fairlead - partlist
1800733-C-07-01	A	Structural report - base frame & main boom
1800752-B-13-74	D	Rollerbox wheels & guides - parts 1
1800752-B-13-79	D	Rollerbox wheels & guides - partlist
1800752-B-13-70	B	Rollerbox wheels & guides - assembly
1800752-B-13-71	B	Rollerbox wheels & guides - parts/welding/machining
1800752-B-13-69	D	Telescope drive - partlist
1800752-B-13-65	A	Telescope drive - parts 2
1800752-B-13-64	B	Telescope drive - parts 1
1800752-B-13-63	A	Fairlead - assembly/welding/parts
1800752-B-13-60	B	Telescope drive - assembly
1800752-B-13-61	C	Telescope drive - welding
1800610-B-30-14	C	5T winch 105m - parts 1
1800610-B-30-13	B	5T winch 105m - machining
1800752-B-13-54	C	Rollerbox - parts 1
1800752-B-13-55	B	Rollerbox - parts 2
1800752-B-13-59	C	Rollerbox - partlist
1800610-B-30-11	B	5T winch 105m - welding
1800610-B-30-10	C	5T winch 105m - assembly
1800752-B-13-50	C	Rollerbox - assembly
1800752-B-13-53	B	Rollerbox - machining

1800752-B-13-51	B	Rollerbox - welding 1
1800752-B-13-49	D	Telescopic boom - partlist
1800752-B-13-48	C	Telescopic boom - parts 5
1800752-B-13-45	B	Telescopic boom - parts 2
1800752-B-13-46	B	Telescopic boom - parts 3
1800502-C-05-03	B	Functional description - HPU-M & L
1800752-B-13-44	C	Telescopic boom - parts 1
1800752-B-13-47	A	Telescopic boom - parts 4
1800752-B-13-42	B	Telescopic boom - welding 2
1800752-B-13-41	B	Telescopic boom - welding 1
1800752-B-13-43	B	Telescopic boom - machining 1
1800752-B-13-40	C	Telescopic boom - assembly 1
1800502-B-85-19	L	HPU-M - partlist
1800752-B-13-35	C	Support boom - parts 2
1800752-B-13-39	F	Support boom - partlist
1800752-B-13-36	E	Support boom - parts 3
1800752-B-13-31	E	Support boom - welding
1800752-B-13-34	B	Support boom - parts 1
1800752-B-13-33	A	Support boom - machining
1800752-B-13-30	F	Support boom - assembly
1800752-B-13-25	E	Cardan boom - parts 2
1800502-B-85-15	I	HPU-M - parts 2
1800752-B-13-24	B	Cardan boom - parts 1
1800752-B-13-29	E	Cardan boom - partlist
1800752-B-13-23	A	Cardan boom - machining
1800752-B-13-21	B	Cardan boom - welding 1
1800733-B-38-30	A	Sleedrive - component
1800752-B-13-20	E	Cardan boom - assembly
1800502-B-85-14	F	HPU-M - parts 1
1800752-B-13-19	G	Knuckle base - partlist
1800752-B-13-15	H	Knuckle base - parts 2
1800502-B-85-12	H	HPU-M - welding 2
1800752-B-13-14	A	Knuckle base - parts 1
1800752-B-13-13	A	Knuckle base - machining
1800502-B-85-11	H	HPU-M - welding 1
1800750-C-05-03	B	Functional description
1800752-B-13-11	A	Knuckle base - welding
1800752-B-13-10	D	Knuckle base - assembly
1800752-B-13-10	F	Knuckle base - partlist
1800733-C-01-09	A	Sleedrive specification
1800733-B-B8-11	C	Luffing cylinder 240/200-3510
1800733-B-B8-12	B	Knuckle cylinder 220/160-3350
1800733-B-80-29	E	Crane M 220 - partlist
1800733-C-01-01	A	Slewbearing - specification
1800502-B-85-10	K	HPU-M - Assembly
1800733-B-30-10	E	Slew bearing assembly
1800733-B-30-19	D	Slewbearing - Partlist
1800733-B-12-31	A	Main boom - knuckle support - welding/parts
1800733-B-12-30	A	Main boom - knuckle support - assembly
1800733-B-12-19	H	main boom - partlist
1800733-B-12-39	A	Main boom - knuckle support - partlist
1800733-B-12-17	G	main boom - parts 4
1800733-B-12-11	C	Main boom - welding 1
1800733-B-12-15	C	Main boom - parts 2
1800733-B-12-16	D	Main boom - parts 3
1800733-B-12-14	A	Main boom - parts 1
1800733-B-12-10	G	main boom - assembly
1800733-B-12-13	B	Main boom - machining

1800610-B-41-20	A	5T/10T 2-fall hook block
1800733-B-11-19	F	Baseframe - partlist
1800733-B-11-17	G	Baseframe - parts 4
1800733-B-11-39	A	Cabin support - partlist
1800733-B-11-16	A	Baseframe - parts 3
1800733-B-11-15	B	Baseframe - parts 2
1800733-B-11-13	C	Baseframe - machining
1800733-B-00-13	B	Load curves - 3T MCK installed
1800733-B-11-10	G	Baseframe - assembly
1800733-B-11-11	B	Baseframe - welding 1
1700218-C-05-01	A	Functional description - KBC w. MC knuckle
1800733-B-11-14	A	Baseframe - parts 1
1800610-C-01-01	B	5T winch drive - specification
1800733-E-01-01	A	Factory acceptance test

Tests carried out

No specific type test is found necessary to require in connection with the Type Approval, but each unit subject to DNVGL certification shall be tested according to DNVGL-ST-0378 Ed. July 2019, Sec.14.

Marking of product

The crane shall be marked according to DNVGL-ST-0378 Ed. July 2019, Sec.14.

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.